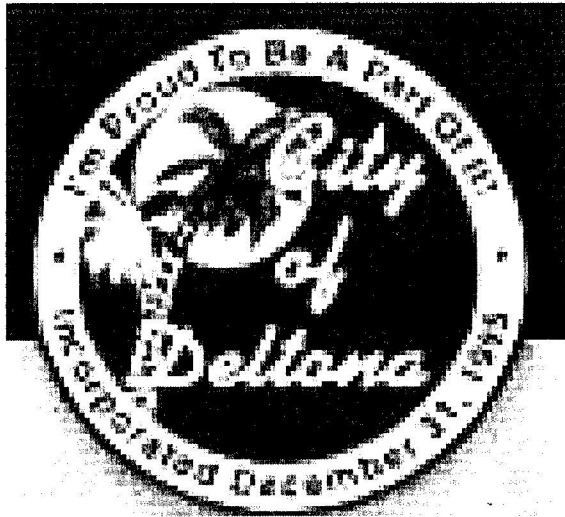


**TECHNICAL SPECIFICATIONS
FOR
CITY OF DELTONA
REMODEL COMMUNITY CENTER FOR VOLUSIA
COUNTY SHERIFF'S OFFICE**

**1691 PROVIDENCE BLVD
DELTONA, FL 32725**



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**DATE: October 20, 2010
Project # 10G0125**

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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes demolition and removal of the following:
 - 1. Buildings and structures.
- B. See Division 15 Sections **OR** drawings for demolishing or relocating site mechanical items.
- C. See Division 16 Sections **OR** drawings for demolishing or relocating site electrical items.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner designated location.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.3 SUBMITTALS

- A. Qualification Data: For the following:
 - 1. Demolition firm.
 - 2. Professional engineer.
 - 3. Refrigerant recovery technician.
 - 4. Abatement firm.
- B. Proposed Protection and Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:
 - 1. Environmental protection.
 - 2. Dust control.
 - 3. Noise control.
- C. Schedule of Building Demolition Activities: Indicate detailed sequence of demolition and removal work, with starting and ending dates for each activity, interruption of utility services, and locations of temporary protection and means of egress.
- D. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, that might be misconstrued as damage caused by building demolition operations. Submit before Work begins.

- E. Landfill Records: If required, indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-demolition Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Areas of any buildings to be demolished will be vacated and their use discontinued before start of Work.
- B. Owner will occupy another building adjacent to demolition area. Conduct building demolition so Owner's operations will not be disrupted.
 - 1. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 - 2. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.
 - a. Do not close or obstruct walkways, exits, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Owner will maintain conditions existing at time of inspection for bidding purpose as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; Immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

- E. Storage or sale of removed items or materials on-site is not permitted.

1.6 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS [(Not Used)]

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before demolition work begins, the General Contractor is to ensure that the demolition subcontractor has reviewed the entire set of construction documents and understands the full scope of the construction project. Any discrepancies between the demolition documents and the new construction documents are to be brought to the attention of the Owner.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.
- C. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- D. Inventory and record the condition of items to be removed and salvaged.
- E. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Architect.
- F. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

3.2 PREPARATION

- A. Refrigerant: Remove and store refrigerant according to 40 CFR 82 and regulations of authorities having jurisdiction.
- B. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with building demolition provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 3. Cut off pipe or conduit a minimum of 12 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

- C. Existing Utilities: Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
- D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- E. Removed and Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area.
 - 5. Protect items from damage during transport and storage.

3.3 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during demolition, cleaned and reinstalled in their original locations after demolition operations are complete.
- C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 1 Section "Temporary Facilities and Controls."
 - 1. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 3. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 4. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

3.4 DEMOLITION, GENERAL (Note: Some items described below may not be included in this project. Review construction drawings to determine which items may apply)

- A. General: Demolish indicated existing items noted completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain adequate ventilation when using cutting torches.
 - 3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as flooding and pollution.

3.5 MECHANICAL DEMOLITION

- A. Remove items noted intact when permitted by authorities having jurisdiction.
- B. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Cut masonry at junctures with construction indicated to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.
- E. Structural Steel: Dismantle field connections without bending or damaging steel members. Do not use flame-cutting torches unless otherwise authorized by Architect or authorities having jurisdiction.
- F. Carpet and Pad: Remove in large pieces and roll tightly after removing demolition debris, trash, adhesive, and tack strips.
- G. Building Components: Remove the following components, as whole units, intact and undamaged:
 - 1. Metal gratings.
 - 2. Metal ladders.

3. Doors.
 4. Windows.
 5. Door hardware.
 6. Cabinets.
 7. Mirrors.
 8. Chalkboards and marker boards.
 9. Tackboards.
 10. Toilet accessories.
 11. Plumbing fixtures.
 12. Light fixtures.
- H. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.
- I. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
- J. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet (1.5 m) outside of footprint indicated for new construction. Abandon utilities outside this area.
- K. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.6 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

3.7 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by building demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.8 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
1. Provide containers or other storage method approved by Architect for controlling recyclable materials until they are removed from Project site.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Transport recyclable materials off Owner's property and legally dispose of them.

- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Owner.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be [recycled,] reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END SECTION 02221

PART 1 - FOUNDATION SUBGRADE PREPARATION:

1.01 GENERAL

- A. Existing Structures: Where the proposed foundations would be located adjacent to, or within one footing width of the existing foundations of the existing buildings, the proposed foundations shall be positioned so that the bottom elevations of the proposed foundations are equal to the bottom elevations of the existing foundations. It is noted that the foundation elements of the existing building must be adequately supported during excavation and placement of the proposed foundations. Methods of supporting the existing foundation should be determined by the Contractor, but may include bracing, underpinning and/or other appropriate methods.

Some settlement of the existing structures foundations can occur if precautions are not taken during construction. This settlement can result in cracking of the existing structures. The contractor shall take precautions during construction to prevent settlement and any damage to adjacent structures.

- B. General Excavation Requirements:

1. The "footprint" of the proposed structures plus a minimum margin of five feet, shall be stripped of all surface vegetation, stumps, debris, or other deleterious materials, as encountered. Any debris encountered during earthwork activities is not suitable for providing foundation support and must be removed to the entire vertical limits and to minimum horizontal margins of 5 feet beyond the edges of the structure. Soils that contain an excessive amount of roots and organic matter shall be overexcavated/replaced with compacted engineered fill prior to footing/slab construction. Removal of the debris may extend to depths below the groundwater table therefore, the use of well points if required for side cut stabilization and to control groundwater during overexcavation and backfilling. Regardless of the dewatering method used, the groundwater table shall be maintained at least 24 inches below all earthwork and compaction surfaces.
2. Special care shall be taken to ascertain that all existing underground structures are removed from the proposed construction area. Pipes shall be removed as they may serve as conduits for subsurface erosion resulting in excessive settlements. Overexcavated areas resulting from the removal of underground structures and/or debris shall be backfilled as described under the "Suitable Fill Material and the Compaction of Fill Soils" Section.
3. During the grubbing operation, roots with a diameter greater than 1/2 inch, stumps, or small roots in a dense state, shall be grubbed and completely removed. Based on the boring log information, significant root concentrations are estimated to be within the upper 1 to 1.5 feet. The actual depth(s) of stripping and grubbing must be determined by visual observation and judgment during the earthwork operation.

- C. Suitable Fill Material and the Compaction of Fill Soils

1. All fill materials shall be free of organic materials, such as roots and vegetation. As a general guide, use fill with 3 to 10 percent by dry weight of material passing the U.S. Standard No. 200 sieve size. The fine sand, slightly silty fine sand and slightly clayey fine sand are suitable as fill materials and, with proper moisture control, should densify using standard, non-vibratory compaction methods. Soils with more than 10 percent passing the No. 200 sieve will be more difficult to compact due to their inherent nature to retain soil moisture.
2. All structural fill shall be placed in level lifts not to exceed 12 inches in uncompacted thickness. Each lift shall be compacted by means of static compaction equipment to at least 95 percent of the modified Proctor (ASTM D-1557) maximum dry density value. The filling and compaction operations shall continue in lifts until the desired elevation(s) is achieved. If hand-held compaction equipment is used, reduce the lift thickness to 6 inches. Use hand held compaction equipment immediately adjacent to existing structures.

D. Foundation Support by Spread Footings and Foundation Compaction Criteria

1. Excavate the foundations to the proposed bottom of footing elevations and, thereafter, verify the in-place compaction for a depth of 24 inches below the footing bottoms. If necessary, compact the bottom of the excavations to achieve a minimum dry density equivalent to 95 percent of the modified Proctor maximum dry density (ASTM D-1557) value for a depth of 24 inches below the footing bottoms.

E. Temporary Excavations:

1. The Contractor shall be familiar with local, state and federal safety regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards. Construction site safety is the responsibility of the Contractor. The Contractor shall also be responsible for the means, methods, techniques, sequences, and operations of the construction. The Contractor should be aware that slope height, slope inclination, and excavation depths (including utility trench excavations) should not exceed those specified in local, state, or federal safety regulations; e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926. Consult with Geotechnical Engineer regarding types of soil present at the site and temporarily side slope inclinations. Soil types may vary throughout the site.

1.02 TESTING

- A. Soil Testing: The Owner will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement will include the following, and as directed by the Architect.

1. Granular Fill Testing: Make gradation test on each sample in accordance with ASTM C 136.
2. Soil Materials: Test for liquid limit in accordance with ASTM D 423, plasticity index in accordance with ASTM D 424, material finer than No. 200 sieve in accordance with ASTM D 1140. One test shall be required from each source and each change in type of material. If a blend is necessary, one test shall be required for each soil used in the blend and one test for proposed blend.
3. In-Place Density Tests: Make tests in randomly selected locations in accordance with ASTM D 1557 as follows:

MATERIALS		TEST FREQUENCY
a.	Fill and Backfill	1 per lift per 2500 sq.ft. (1 test min.)
b.	Subgrade	1 per lift per 2500 sq.ft. (1 test min.) to a depth as indicated in Soils Report.
c.	Continuous Wall Footings.	1 test every 100 lin. ft.
d.	Individual Column Footings.	1 test at each Footing.

END OF SECTION

PART 1 - GENERAL:

1.01 DESCRIPTION:

The work under this Section of the Specifications includes all labor, materials, equipment and services necessary to complete the concrete formwork as shown on the Drawings and herein specified.

1.02 RELATED SECTIONS:

- A. 03210 Concrete Reinforcement
- B. 03311 Normal Weight Structural Concrete

1.03 QUALITY ASSURANCE:

Work performed shall be in accordance with American Concrete Institute (ACI) Standards.

- A. Specifications for Structural Concrete for Buildings (ACI 301-95).
- B. Building Code Requirements for Reinforced Concrete (ACI 318-02).
- C. Proposed Revision and the Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304-95).
- D. Recommended Practice for Concrete Formwork (ACI 347-95) for Shoring and Re-shoring in Multi-story Construction, as shown herein specified.

PART 2 - PRODUCTS:

2.01 MATERIALS:

- A. Forms for Concrete:
 - 1. Plywood, boards, metal or other acceptable materials. Plywood shall be not less than 3/4 inch thick, conforming to U.S. Product Standard PS-1 for B-B concrete form Plywood, Class 1, Exterior Grade, mill oiled and edge sealed.
 - 2. Earth forms permitted based on soil conditions.
- B. Accessories:
 - 1. Form Ties:
Snap tie type as best suited to support loads of forms and concrete. Ties shall be removed to a minimum depth of one inch inside of concrete.
 - 2. Form Releasing Agent: Non-staining form oil, type as selected to provide a positive release of forms from concrete surface.

PART 3 - EXECUTION:

3.01 Installation:

A. Shapes and Dimensions:

1. Construct forms to the exact sizes, shapes, lines, and dimensions required to obtain accurate alignment, location, grades, level and plumb work in the finished structure.
2. Provide for offsets, anchorages and inserts, and other features required in the work.

B. Shoring And Re-Shoring:

1. Extend shoring or re-shoring to ground. Space shoring in such a manner that no floor or member will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.
2. Remove Shores and Re-shore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate re-shoring to safely support work without excessive stress or deflection.
3. Keep re-shores in place a minimum of 7 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

C. Formwork:

1. Responsibility:

Contractor shall be fully responsible for adequacy of shoring and formwork in its entirety. Forms shall support loads they will be required to sustain and shoring and reshoring shall maintain their dimensional and surface correctness to provide members required by Drawings.

2. Application of Form Coating:

Immediately before placing reinforcing, coat faces of forms in contact with concrete with form releasing agent, applied in compliance to manufacturer's recommendations.

3. Removal of forms:

Formwork supporting weight of concrete, such as beam soffits, joists, slabs and other structural elements, may not be removed in less than 3 days and until concrete has attained design minimum compressive strength at 28 days. Determine the potential compressive strength of in place concrete by testing field-cured specimens representative of concrete location or members.

4. Form facing material may be removed 1 day after placement, only if shores

and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

5. Apply curing compound to all formed surfaces when formwork is removed in less than 7 days.
6. Reused forms shall be thoroughly cleaned of dirt, debris, concrete, and foreign matter. Forms shall not be reused if they have developed defects which would affect their tightness and strength.

D. Adjust and Clean:

1. Repair any form members which have been damaged prior to placement of concrete. Maintain forms in excellent condition prior to placement, and during curing of all concrete.

END OF SECTION

PART 1 - GENERAL:

1.01 DESCRIPTION:

The work under this Section of the Specifications includes all labor, materials, equipment and services necessary to complete the concrete reinforcement as shown on the Drawings and herein specified.

1.02 RELATED SECTIONS:

- A. 03100 Concrete Formwork
- B. 03311 Normal Weight Structural Concrete

1.03 QUALITY ASSURANCE:

Work performed shall be in accordance with American Concrete Institute (ACI) Standards.

- A. Specifications for Structural Concrete for Buildings (ACI 301-95).
- B. Building Code Requirements for Reinforced Concrete (ACI 318-02).
- C. Proposed Revision and the Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304-95).
- D. Recommended Practice for Concrete Formwork (ACI 347-95) for Shoring and Re-shoring in Multi-story Construction, and as herein specified.

1.04 SUBMITTALS:

Submit Shop Drawings for approval of reinforcement showing bar sizes and arrangements, splice details, notes, support bars, and accessories. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".

PART 2 - PRODUCTS:

2.01 MATERIALS:

- A. Reinforcing Bars:
New deformed bars free from rust, scale, and oil complying with ASTM A 615, manufactured from billet steel, Grade 60, yield strength 60,000 psi minimum.
- B. Ties and Stirrups:
ASTM A615, Grade 40 or Grade 60.
- C. Welded Wire Fabric:
ASTM A 185, cold drawn wire, size and gage as indicated on drawings.
- D. Foundations:
Use precast concrete pads of proper depth. Do not use wire chairs. Use #5 standees for top steel.

- E. Reinforcing Accessories:
Stainless steel, Galvanized steel or plastic-tipped accessories with up-turned legs as required for supporting and fastening reinforcing bars and welded wire fabric in place as per CRSI recommendations, and as shown on the drawings.

PART 3 - EXECUTION:

3.01 INSTALLATION:

- A. General:
Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Arrange, space and securely tie reinforcement together with minimum 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Hold reinforcing tolerance position. Use only approved shop drawings to position reinforcing.
- B. Vertical Reinforcing:
Reinforcing in columns shall be continuous; lap as shown on the drawings. Dowel reinforcing shall be as detailed on approved submittals.
- C. Horizontal Reinforcing:
Reinforcing in beams shall be continuous, lapping as detailed on approved submittals.
- D. Welded Wire Fabric Reinforcement:
Cut to required size and lay flat in place. Lap fabric 8" at sides and ends and securely wire together and to other reinforcement at frequent intervals with 16 gage wire.
- E. Architect shall be notified 48 hours in advance of each pour in order to schedule periodic inspections.
- F. Coverages:
Concrete protection for reinforcement shall conform to ACI 318 and approved placement drawings. Minimum requirements include the following:
 - 1. Concrete deposited against the ground: 3".
 - 2. Concrete exposed to weather: 2" for reinforcing bars larger than No. 5 and 1-1/2" for No. 5 bars and smaller.
 - 3. Concrete not exposed directly to ground or weather: 3/4 in. for slabs, 1-1/2" for beams and walls.
 - 4. Concrete in columns: 1-1/2".

END OF SECTION

PART 1 - GENERAL:

1.01 DESCRIPTION:

The work under this Section of the Specifications includes all labor, materials, equipment and services necessary to complete the concrete work as shown on the Drawings and herein specified.

1.02 RELATED SECTIONS:

- A. 03100 Concrete Formwork
- B. 03210 Concrete Reinforcement

1.03 QUALITY ASSURANCE:

Work performed shall be in accordance with American Concrete Institute (ACI) Standards.

- A. Specifications for Structural Concrete for Buildings (ACI 301-95),
- B. Building Code Requirements for Reinforced Concrete (ACI 318-02).
- C. Proposed Revision and the Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304-95).
- D. Recommended Practice for Concrete Formwork (ACI 347-95) for Shoring and Re-shoring in Multi-story Construction, and as herein specified.

1.04 SUBMITTALS:

Design mixes for each class of concrete shall be submitted for review prior to pouring any concrete. The design mixes shall list all ingredients and admixtures and shall list the slump. Submittals shall include current (within last 12 months) field experience or trial batch data to indicate satisfactory performance of each mix design used. Submit manufacturer data for all admixtures.

1.05 ADJUSTMENT TO CONCRETE MIXES:

Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in the work.

PART 2 - PRODUCTS:

2.01 Materials:

- A. Portland Cement: ASTM C 150, Type I.
- B. Aggregates: ASTM C33/Fine and coarse aggregates.
- C. Water: Potable, clean and free from deleterious amounts of acids, alkalis, or organic materials.

- D. Fly Ash and Pozzolans: ASTM C 618, except that loss on ignition of Class F fly ash shall not exceed 6%. Limit use of fly ash not to exceed 25% of cement content by weight. Provide fly ash from a single source for exposed concrete.
- E. Slag: ASTM C989, Grade 120. "Standard Specification for Ground Iron Blast - Furnace Slag for use in Concrete and Mortars." Limit use of slag not to exceed 50 percent of cement content by weight.
 - 1. Acceptable products:
 - a. NEWCEM
- F. Water-Reducing Admixture: ASTM C494, Type A, type to density of concrete but containing no calcium chloride.
- G. Air-Entraining Admixture: ASTM C260.
- H. Curing Materials: ASTM C309, method as selected to keep concrete moist during curing period. In the case curing compounds are used in areas where waterproofing membrane is required, the compound must be type that is compatible with waterproofing membrane.
- I. Expansion Joint Filler: Shall be non-extruded resilient type, conforming to ASTM D1751 (bituminous) for exterior use, and ASTM D1752 (non-bituminous) for interior use.
- J. Non-Shrink Grout: CRD-C 588, factory pre-mixed grout.

2.02 MIXES:

- A. Classes of Concrete:
 - 1. Standard Weight Concrete: 3000 psi strength at 28 days, 470 lbs. cement per cu. yd. minimum, w/c ratio, 0.58 maximum.
 - 2. Standard Weight Concrete for 2" pump mix: 3000 psi strength at 28 days, 470 lbs. cement per cu. yd. minimum, w/c ratio, 0.58 maximum, 900 lbs. minimum of 3/8" coarse aggregate.
 - 3. Standard Weight Concrete for Masonry Fill Cells Only: 3000 psi strength at 28 days with coarse aggregate 3/8" minimum, w/c ratio .65 maximum. Note: This class of concrete not to be used for columns and tie beams. Test in accordance with ASTM C 1019.
- B. Slump Limits:
Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. Ramps and sloping surfaces: Not more than 3".
 - 2. Reinforced foundation systems: Not less than 3" and not more than 5".

3. Reinforced masonry filled cells: For pea gravel concrete, no less than 9" or more than 11".
4. All other concrete: Not less than 3" and not more than 5".
5. Addition of water at the site to increase slump will not be permitted except as herein specified. Contractor will maintain a slump cone at site during all concrete operations, and slumps BEFORE and AFTER addition of water will be recorded on each batch ticket. Slump test will be performed by qualified personnel in accordance with ASTM C143. Quantity of water added to each batch will be accurately measured and recorded on each batch ticket. Maximum water added at the site will not exceed one gallon per cubic yard of concrete. General Contractor is responsible for all concrete receiving additional water.

Addition of water to batch will not be permitted for concrete delivered to site with slump within specified tolerances.

Concrete delivered to site with slumps greater than specified will be rejected.

Concrete delivered to site with slumps lower than the minimum specified may receive additional water as herein specified. If recorded slump after the addition of water remains below that specified, or if slump increases above the maximum specified, concrete batch will be rejected.

- C. Air Entrainment:
2% to 4% air, all concrete.
- D. Ready-Mix Concrete:
Concrete shall be transit-mixed concrete batched, mixed and supplied in accordance with ASTM C 94. Total mixing time shall not exceed 1 1/2 hours. Reduce mixing time in accordance with ASTM C 94.

PART 3 - EXECUTION:

- 3.01 Preparation:
The Contractor shall coordinate the setting of all bolts, inserts, anchors, embeds, sleeves, dovetail slots, and other miscellaneous items as work progresses. The Contractor shall also coordinate openings, slopes, and depressions in concrete slabs as shown on the Drawings.
- 3.02 Installation:
 - A. Placement:
Concrete shall be placed in final position to avoid separation due to rehandling or flowing. Full vibration of mix shall be used to consolidate concrete in forms and around reinforcing.
 - B. Finishing:
 1. Joints: Finish edge along joints neatly with edging tool.

2. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
3. Smooth-Rubbed Finish: Exterior and interior concrete surfaces which will not be covered by other construction shall receive a smooth rubbed finish.
4. Float and Trowel Finish: All floor slabs to receive finish floorings shall be floated and steel troweled. Slab shall be level with a tolerance of 1/8" in 10' except where drains occur, in which case the floors shall be pitched to the drains in direction indicated on Drawings.
5. Non-Slip Broom Finish: Apply non-slip broom finish to concrete platforms, steps, and ramps, areas to receive hard tile and elsewhere as shown on the drawings.

C. Curing:

Concrete shall be cured in a manner to establish the full strength and to avoid premature drying. All exposed surface concrete slabs, columns, and beams shall be sprayed with curing compound. Formed surfaces shall be sprayed immediately after form removal. Concrete surfaces to receive water-proofing membrane shall be sprayed with a compatible membrane curing compound, and shall be installed per the manufacturer's instructions. Concrete slabs on grade shall be placed over 10 mil. polyethylene vapor barrier with 6" lapped and taped joints.

D. Joints:

1. Construction Joints: Locate and install construction joints, which are not shown on drawings, so as not to impair strength and appearance of the structure, as acceptable to the Architect. Proposed construction joint locations shall be submitted for review prior to construction.
2. Provide Keyways at least 1-1/2" deep in construction joints in slabs and footings; approved bulkheads designed for this purpose may be used for slabs.
3. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.
4. Contraction (Control) Joints in Slabs-on-ground:
Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use inserts 1/4" wide x 1/3 of slab depth, unless otherwise indicated.
5. Form contraction joints: Use galvanized metal keyways. Contraction joints may be formed by saw cuts. Saw cuts shall be made as soon after slab

finishing as possible without dislodging aggregate.

6. Beam construction joints: Where horizontal construction joints between upturned beams and slabs are indicated on the drawings, the second pour for the top of the concrete beam shall be made within 24 hours of pouring the concrete slab. The surface between concrete pours shall receive a full 1/4" minimum deep roughened finish.

E. Concrete Surface Repairs:

1. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.
2. Mix dry-pack mortar, consisting of one part portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
 - a. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
 - b. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
3. Structural repairs shall be performed as directed by the Architect/Engineer.

PART 4 - CONCRETE TESTING:

4.01 Quality Control Testing During Construction:

- A. The owner will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete will include the following and as directed by the Architect. All sampling for pumped concrete shall be performed at the discharge end of the hose, unless otherwise indicated.
- C. Sampling Fresh Concrete:
ASTM C 172, except modified for slump to comply with ASTM C 94.
- D. Slump:
ASTM C 143; one test for each concrete load at point of discharge; and one test for each set of compressive strength test specimens.

- E. Air Content:
ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure for normal weight concrete; one for each set of compressive strength test specimens.
- F. Concrete Temperature:
Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens is made.
- G. Compression test for masonry fill concrete:
ASTM C 1019 in accordance with ACI 530.1 "Specifications for Masonry Structures".
- H. Compression Test Specimen:
ASTM C 31; one set of 4 standard cylinders (from same batch of concrete) for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
- I. Compressive Strength Tests:
ASTM C 39; one set for each 50 cubic yards or fraction thereof, of each concrete class placed in any one day, or for each 4000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 2 specimens tested at 28 days with the average used for concrete evaluation, and 1 specimen retained in reserve for later testing if required.
 - 1. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
 - 2. When total quantity of a given class of concrete is less than 50 cubic yards, strength test may be waived by Architect if, in his judgment, adequate evidence of satisfactory strength is provided.
 - 3. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - 4. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test falls below specified compressive strength by more than 500 psi.
- J. Test Results will be reported in writing and sent directly to Architect and Contractor on same day that test are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and material; compressive breaking strength and type of break for 7-day test, and 28-day tests.
- K. Additional Tests:
The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been

attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

1. Contractor shall pay for such additional testing as may be required, when unacceptable concrete is verified.

L. Defective Work:

Concrete work which does not conform to the specified requirements, including strength, tolerances, and finishes, shall be corrected at the Contractor's expense, without extensions of time.

1. The Contractor shall also be responsible for the cost of corrections to any other work affected by or resulting from corrections of the concrete work.

END OF SECTION

PART 1 - GENERAL:

- 1.01 Description of Work:
Extent of each type of masonry work is indicated on the drawings.
- 1.02 Codes and Standards:
Masonry construction and materials shall conform to all requirements of The Florida Building Code and the "Specifications for Masonry Structures" ACI 530.1, published by the American Concrete Institute, Detroit, Michigan, unless more stringent requirements are specified herein.
- 1.03 Qualifications and Inspections:
- A. Concrete Masonry Inspections:
Provide masonry construction inspection and written reports of concrete masonry walls indicated as requiring inspection on the Masonry Plans to insure that masonry construction is in conformance with the Contract Documents. Masonry inspection is required for those masonry elements which must be constructed to attain high design strengths, including, but not limited to, vertically reinforced grouted CMU walls, grouted CMU wall, and load-bearing CMU walls.
- Inspection Agency shall be either a certified masonry inspector or a Registered Structural Engineer. Submit certification to A/E prior to the Pre-Masonry Conference. The individual or individuals who will perform the masonry inspection shall be present for the Pre-Masonry Conference. The inspection agency shall be independent of the certified masonry contractor.
- Inspection shall use NCMA-TEK 65 Field Inspection of Engineered Concrete Masonry and NCMA-TEK 132 Inspector's Guide for Concrete Masonry Construction and ACI 530.1 as guidelines.
- The masonry inspector shall prepare a written report or reports for each day of inspection. Each report shall include project identification name and number, name of masonry contractor, name of inspecting service, date of report, specific location of work inspected, horizontal joint reinforcing size, type, spacing, and lap, preparation of cores and cavities to be grouted, inspect every core and cavity, vertical reinforcing centering clip size, type, spacing, and proper alignment, size spacing and lap of vertical reinforcing and installation in centering clips, installation and vibration of grout in cores and cavities, remarks as to general conditions pertinent to the strength and quality of the masonry work.
- The masonry inspector shall be present and observe all grouting operations in walls requiring inspection. The masonry inspector shall be present at the project site within sufficient time, in advance of grouting operations, to inspect the construction to insure its conformance to the contract Documents and that grouting may proceed. Periodically, the masonry inspector shall be present during the placing of masonry units and reinforcement. No grouting shall be permitted unless the masonry inspector is present and has indicated that the masonry construction is properly prepared for the grouting operation.
- 1.04 Submittals:

- A. Product Data:
Submit manufacturer's specifications and other data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements. Include instructions for handling, storage, installations and protection. Submittals shall include certification that masonry units comply with specified strength requirements.

1.05 Job Conditions:

- A. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.
- B. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- C. All Filled Cells and Columns shall be poured at least two hours prior to pouring lintel block or tie beams. Maximum construction height of masonry walls without filled cell or column pours shall be 4'-0". Provide clean out holes at the base of filled cells which have grout heights in excess of 4'-0". The holes shall be kept open for inspection. The concrete for filled cells shall be vibrated with a mechanical pencil vibrator during placement to insure complete filling of the block core, and re-consolidated with the vibrator before final set, approximately 10 to 30 minutes after initial placement depending on grout consistency and weather conditions. Fill all cells containing reinforcing steel. Provide prefabricated "tee" and corner sections of masonry "Dur-O-Wall" type reinforcing at all intersecting masonry walls. Lap splice all horizontal wall reinforcing 6".

PART 2 - PRODUCTS:

2.01 Masonry Units, General:

- A. Concrete Masonry Units (CMU):
ASTM C90, Grade N-1, Type II (non- moisture controlled) Regular Weight Units. Masonry units shall have a minimum net area compressive strength of 1900 PSI for a minimum compressive strength of masonry assemblage (f'm) of 1500 PSI.
1. Size:
Manufacturer's standard units with nominal face dimensions of 16" long x 8" (15-5/8" x 7-5/8" actual), unless otherwise indicated.
 2. Special Shapes: Provide where required for lintels, corners, jambs, control joints, headers, bonding, scored accent walls and other special conditions.
- B. Mortar Materials:
1. Portland Cements: ASTM C150, Type I.
 2. Sand Aggregate: ASTM C144. Once approved, use sand from same source for entire project.

3. Water: Potable.
4. Hydrated Lime: ASTM C207, Type S.
5. Masonry Cement: ASTM C91.

2.02 Materials:

- A. All masonry reinforcement, anchors, ties and metal embedded in masonry shall be galvanized, in accordance with ASTM A 153, Class B-2, Hot-Dip, (1.50 oz. per sq. ft.).
- B. Continuous Wire Reinforcing and Ties for Masonry: Provide welded wire horizontal joint reinforcement units prefabricated in straight lengths of not less than 10 feet, with matching corner and tee units. Fabricate from cold-drawn steel wire complying with ASTM A82, with deformed continuous side rods and plain cross-rods, and a unit width of 1-1/2" to 2" less than thickness of wall or partition.
- C. Horizontal Joint Reinforcement:
 1. All Concrete Masonry Walls: Standard No. 9 gauge ladder type unless otherwise indicated.
 2. Galvanize horizontal joint reinforcement after fabrication with 1.5 oz. zinc coating. Hot-dipped galvanized is required for reinforcing in all exterior walls.
 3. Space all horizontal joint reinforcing at 16" o.c. vertically, unless otherwise noted.
- D. Acceptable Manufacturers:
 1. DUR-O-WALL.
 2. AA Wire Products Company.
 3. Heckman Building Products, Inc.
 4. Masonry Reinforcing Corporation of America.
 5. Hohman and Barnard
 6. Wire Bond
- E. Masonry Accessories:
 1. Reinforcing Bars:
Deformed steel, ASTM A615, Grade 60 of the sizes shown.
 2. Mechanical reinforcing positioners shall be used thru-out to hold reinforcing in the proper location and position prior to and during the grouting operation. Locate positioners at top and bottom, and at 4'-0 o.c. maximum.

3. Angle Lintels: A minimum of not less than 5 x 3 1/2 x 1/4 with 8 inch bearing each end, unless otherwise indicated. Hot-dip galvanize all steel lintels.
- G. Mortar and Grout Mixes:
1. Mortar:
Except as otherwise specified, mortar shall be ASTM C270, Type S. Mortar shall be accurately measured by VOLUME (proportion method). Mortar for walls and partitions of concrete block shall be one of the two following mixes, at Contractor's options:

1 part Portland Cement	1/2 part Portland Cement
1/2 part Lime Putty	or 1 part Masonry Cement
4 parts Sand	4 parts Sand
 2. Mortar and Grout Mixes:
Do not use calcium chloride in mortar or grout.
 3. Grout: ASTM C476.
 4. Concrete Fill For Reinforced Cells:
See concrete specifications.

PART 3 - EXECUTION:

3.01 Installation, General:

- A. Cleaning:
Protect masonry against staining from wall coverings or by other sources and wipe excess mortar off surface as work progresses. After work of this section has been completed, clean concrete block masonry surfaces with stiff fiber brushes, leaving concrete block masonry clean, free of mortar daubs, and with tight mortar joints throughout. Immediately after cleaning, rinse down concrete block masonry surfaces thoroughly with clear water.
- B. Mechanical reinforcing positioners shall be used thru-out to hold reinforcing in the proper location and position prior to and during the grouting operation. Locate positioners at top and bottom, and at 4'-0 o.c. maximum.

3.02 Masonry Testing:

- A. The owner will employ a testing laboratory to perform test and to submit test results.
 1. Masonry Grout
Test masonry grout in accordance with ASTM C1019, one test for every 5000 square feet of wall area or every 50 cubic yards, whichever is less, but not less than one test for each days pour.
 2. Masonry Mortar:

Perform pre-construction and construction testing of masonry mortar in

accordance with ASTM C780 as indicated below. One test for every 5000 square feet of wall area.

- a. Annex A4: Mortar aggregate ratio test method .
- b. Annex A7: Compressive strength of molded masonry mortar cylinders and cubes.

END OF SECTION

PART 1 - GENERAL:

- 1.01 DESCRIPTION OF WORK: The work under this section of the specifications includes all labor, materials, equipment and services necessary to complete the structural framing as shown on the drawings and as herein specified.

A. Related Sections

1. Section 09220: Portland Cement Plaster
2. Section 09260: Gypsum Board Assemblies

- 1.02 EXTENT OF LIGHT GAGE FRAMING is shown on drawings. Types of lightgauge metal framing units include the following:

"C" shaped steel studs.
"SJ" shaped steel studs.

- 1.03 QUALITY ASSURANCE: Work shall be performed in accordance with AISI "Specifications for Design of Cold-Formed Steel Structural Members", 2001 Edition and American Welding Society (AWS). All welding shall be performed by certified welders. System shall be installed by personnel experienced in lightgauge steel framing installation.

- A. STANDARDS: AWS "Code for Welding in Building Construction, D1.0"
ANSI Z49.1 - 1973 "Safety in Welding and Cutting"

AISI "Specification for the Design of Cold-Formed Steel Structural Members", 2001 Edition.

ASTM A-568 Standard Specification for general requirements for steel, carbon and high strength low-alloy hot rolled sheet and cold rolled sheet.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's product information and installation instructions for each item of lightgauge framing and accessories.
- B. Shop Drawings: Submit shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data.
1. Include placing drawings for framing members showing size and gage designations, number, type, location and spacing. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.
- C. Materials Certification: Submit certification of materials from the manufacturer to show compliance with these specifications and related drawings.

- D. See Performance Requirements for additional submittals when manufacturer designed components are used.
- E. Submittals shall include a minimum of one reproducible sepia and three prints of each sheet.

PART 2 - PRODUCTS:

2.01 METAL FRAMING:

- A. System Components: With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, bracing, and accessories as recommended by manufacturer for applications indicated and as shown on the drawings, as needed to provide a complete steel framing system.
- B. Component Design: Compute structural properties of studs and joists in accordance with AISI "Specification for the Design of Cold-Formed Steel Structural Members", 2001 Edition with latest revisions.
- C. Fire-Rated Assemblies (Not Used): Where steel framing members are components of assemblies indicated for a fire- resistance rating, including those required for compliance with governing regulations, provide members which have been approved by governing authorities having jurisdiction.

2.02 MATERIALS AND FINISHES:

- A. ASTM A-446 Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality. Minimum yield stress as indicated.
- B. ASTM A-525 Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements, minimum G60 coating.
- C. "C" Shaped Studs: Manufacturer's standard structural steel studs of size, shape, and gage indicated, with 1.625" flange and 1/2" flange return lip. Metal stud and joist designations indicated on the drawings are based on published product information and load tables of Steel Stud Manufacturers Association (SSMA). Metal framing shall be by Steel Stud Manufacturers Association (SSMA) or approved equal, conforming to size, gage, strength, and serviceability of that indicated. Approved equal manufacturers shall submit certification that components comply with these requirements.
- D. Galvanizing Repair Paint: High zinc dust content paint for repair of galvanized surfaces damaged by welding, complying with M.I. Spec. Mil-P-21035.
- E. Welding: E 60XX Electrodes of proper size for material thickness joined. All welds shall be de-slagged and painted with galvanizing zinc-rich repair paint by this section after welding is completed.

PART 3 - EXECUTION:

3.01 LIGHT GAGE METAL FRAMING:

- A. All light gage metal framing shall be galvanized metal "C-studs" as shown below, in the specifications, and as indicated on the drawings. Sizes and section properties indicated are based on strength and service requirements from the published tables of Steel Stud Manufacturers Association (SSMA), latest edition. Manufacturers of equal members may be accepted, subject to review and approval of the Engineer. Size, gage and spacing shown shall not be reduced or changed from those shown.

3.02 GENERAL FRAMING NOTES:

- A. Steel strength for primary and miscellaneous framing, U.N.O.: $F_y = 33,000$ PSI, 18 gage and lighter, $F_y = 50,000$ PSI 16 gage and heavier, $F_y = 33,000$ PSI for runners and tracks.
- B. For curtain wall studs at openings, add one-half number of interrupted studs plus one stud at each side of wall openings.
- C. Attach tracks to concrete with 2 - 1/4" tapcons at 16" o.c., u.n.o. Attach tracks to steel with 2 - no. 10 screws at 16" o.c., u.n.o.
- D. Attach studs to tracks with minimum 1 - no. 10 screw each flange, u.n.o.
- E. Weld studs and joist where indicated on the drawings. Welding shall be performed by certified welders. Use E60XX electrodes of proper size for material thickness joined.
- F. All screw attached connections shall be with No. 10 screws, four screws per connection, u.n.o.
- G. See drawings for additional light gage framing sizes and details required. Provide all accessories, bent plates, angles, etc. as indicated.
- H. Galvanize metal stud framing for minimum G60 coating.
- I. Coordinate all metal stud framing with other manufacturers and suppliers of attached components and finishes. Provide and install any additional or supplemental framing that may be required for a complete system, including finish systems, control and expansion joints, flashings, etc. as may be required.
- J. Install horizontal stiffeners in stud system at four feet on centers vertical spacing, u.n.o. Attach with screw attached clip angles or weld.
- K. Powder actuated "shot-in" type fasteners (PAF) are prohibited for any structural connections to concrete or masonry members. PAF fasteners may be used to connect to structural steel where shown on the drawings. PAF shall be minimum 0.145" diameter X-EDNI by Hilti, or approved equal, unless otherwise indicated.

3.03 FABRICATION:

- A. General: Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion.
- B. Fastenings: Attach similar components by welding or as indicated on the drawings. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer, or as indicated on the drawings.
 - 1. Wire tying of framing components will not be permitted.
 - 2. Splices will not be allowed except where noted on contract drawings.

3.04 ERECTION:

- A. Delivery and Storage: Protect lightgauge steel framing members from rusting and damage. Deliver to project site in bundles, fully identified with name, brand, type and grade. Store off ground in a dry ventilated space or protect with suitable waterproof coverings.
- B. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations and approved shop drawings.
- C. Erect all axial load bearing and curtain wall studs as indicated herein.
- D. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as shown on the drawings. Provide fasteners at corners and ends of tracks.
- E. Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.
- F. Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.
- G. Framing of wall openings shall include headers and supporting studs as shown on the drawings or as per manufacturer's standard.
- H. Temporary bracing, where required, shall be provided until erection is completed.
- I. Diagonally braced stud walls, as indicated on the drawings shall be provided at locations designated as "shear walls" for frame stability and lateral load resistance. Additional studs, when necessary, shall be positioned to resist the vertical components.
- J. Splices in axially loaded studs shall not be permitted.

- K. Provisions for structure vertical movement shall be provided where indicated on the drawings.
- L. Frame both sides of expansion and control joints, as shown for the wall system, with separate studs and do not bridge the joint with components of the stud system.
- M. Handling and lifting of prefabricated panels shall be done in a manner so as not to cause distortion in any member.
- N. Jack studs or cripples shall be installed below window sills, above window and door heads, and elsewhere to furnish supports, and shall be securely attached to connecting members.
- O. Lateral bracing shall be provided by use of gypsum board and gypsum sheathing or by horizontal straps or cold-rolled channels.
- P. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
- Q. Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- R. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
- S. Install horizontal stiffeners in stud system, spaced (vertical distance) at not more than 4'-0" o.c. Weld at each intersection, or provide screw attached clip angles at each stud.

3.05 ERECTION OF JOISTS:

- A. Provide uniform and level joist bearing at foundation walls by means of shims and/or non-settling grout if required.
- B. Joists shall be located directly over bearing studs or a load distribution member shall be provided at the top of the bearing wall, as per manufacturer's standard.
- C. Web stiffeners shall be provided at reaction points and/or at points of concentrated loads where indicated on the drawings.
- D. Joist bridging shall be provided where indicated on the drawings, or as per manufacturer's standard.

- E. Additional joists shall be provided under parallel partitions when the partition length exceeds one-half the joist span, also around all floor and roof openings which interrupt one or more spanning members, unless otherwise noted.
- F. End blocking shall be provided where joist ends are not otherwise restrained from rotating.
- G. Field Painting: Touch-up shop-applied protective coatings damaged during handling, installation and welding. Use galvanizing repair paint for galvanized surfaces.

3.06 PERFORMANCE REQUIREMENTS:

- A. The exterior curtain wall system shall be designed to withstand both positive and negative pressure with a maximum deflection of $L/600$ for brick, $L/360$ for stucco finish, and $L/240$ for finishes not likely to be damaged, considering the section properties of only the bare stud.
- B. Design wind loads shall be in accordance with the current edition of the governing model code and local governing agencies, and as indicated on the drawings.
- C. Submit complete structural calculations for the steel stud curtain wall system. Calculations shall cover all studs, jamb studs, runner track, bracing, attachment of lightgage framing to lightgage framing, and attachment of lightgage framing to concrete or structural steel.
- D. Submit placing drawings for steel stud curtain wall system showing the number, type, location, and spacing of all members. All attachments shall be clearly detailed on the drawings. Indicate supplemental strapping, bracing, clips, and other accessories required for proper installation. All calculations and drawing submittals shall be signed and sealed by a registered structural engineer.
- E. Calculations and drawings must be approved in writing by Project Engineer before work can begin.
- F. All sizes, gages, and attachments of lightgage metal framing members and components shown on the drawings are minimums required, and shall be increased if required by design. No sizes, section properties or attachments shall be reduced from those shown.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Wood framing.
- 2. Wood blocking.
- 3. Wood cants.
- 4. Wood nailers.
- 5. Wood furring.
- 6. Wood sheathing.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product indicated.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.
- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.
- C. Research/Evaluation Reports: For the following:
 - 1. Power-driven fasteners.
 - 2. Expansion anchors.
 - 3. Metal framing anchors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Provide dry lumber with [19] [15] percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWWA C20 (lumber) and [AWPA C27 (plywood)]. Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
 - 2. Use treatment that does not promote corrosion of metal fasteners.
 - 3. Use Exterior type for exterior locations and where indicated.
 - 4. Use Interior Type A High Temperature (HT), unless otherwise indicated.

2.4 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade any of the following species:
 - 1. Mixed southern pine; SPIB.
 - 2. Northern species; NLGA.

2.5 SHEATHING

- A. Plywood Wall Sheathing: Exterior, Structural I sheathing.

2.6 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch (12.7 mm) thick.

2.7 MISCELLANEOUS MATERIALS

A. Fasteners:

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners [with hot-dip zinc coating complying with ASTM A 153/A 153M] [of Type 304 stainless steel].
2. Power-Driven Fasteners: CABO NER-272.
3. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

B. Metal Framing Anchors: Made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

1. Manufacturers:

- a. Alpine Engineered Products, Inc.
- b. Cleveland Steel Specialty Co.
- c. Harlen Metal Products, Inc.
- d. KC Metals Products, Inc.
- e. Silver Metal Products, Inc.
- f. Simpson Strong-Tie Company, Inc.
- g. Southeastern Metals Manufacturing Co., Inc.
- h. United Steel Products Company, Inc.

2. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
3. Allowable Design Loads: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate [furring,] nailers, blocking, [grounds,] and similar supports to comply with requirements for attaching other construction.
- B. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. CABO NER-272 for power-driven fasteners.
 2. Published requirements of metal framing anchor manufacturer.

3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in the Uniform Building Code.
 4. Table 2305.2, "Fastening Schedule," in the BOCA National Building Code.
 5. Table 2306.1, "Fastening Schedule," in the Standard Building Code.
- C. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- D. Fastening Methods:
1. Sheathing: Nail to wood framing.
 2. Plywood Backing Panels: Nail or screw to supports.

END SECTION 06100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood cabinets.
 - 2. Plastic-laminate cabinets.
 - 3. Plastic-laminate countertops.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 - 2. Division 6 Section "Finish Carpentry" for interior carpentry exposed to view that is not specified in this Section.

1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated cabinet hardware and accessories.
- B. Select paragraph above or below and edit to suit Project, or delete both if not applicable.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.
 - 4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
 - 5. Apply WIC-certified compliance label to first page of Shop Drawings.

- D. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated.
 - 1. Plastic laminates.
- E. Samples for Verification: For the following:
 - 1. Plastic-laminate-clad panel products, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.
 - 2. Corner pieces as follows:
 - a. Cabinet front frame joints between stiles and rail, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
 - b. Miter joints for standing trim.
 - 3. Exposed cabinet hardware and accessories, one unit for each type [and finish].
- F. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes, and other requirements.
 - 1. Provide AWI Quality Certification Program labels certificate indicating that woodwork complies with requirements of grades specified.
- E. Quality Standard: Unless otherwise indicated, comply with WIC's "Manual of Millwork" for grades of interior architectural woodwork, construction, finishes, and other requirements.

1. Provide WIC-certified compliance certificate indicating that woodwork complies with requirements of grades specified.
 2. Provide WIC-certified compliance certificate for installation.
 3. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.
- F. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.
- 1.7 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Division 8 Section "Door Hardware" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.1 WOODWORK FABRICATORS

- A. Available Fabricators: Subject to compliance with requirements, fabricators offering interior architectural woodwork that may be incorporated into the Work include, but are not limited to, the following:

2.2 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
 - 2. Particleboard: ANSI A208.1, Grade M-2.
 - 3. Softwood Plywood: DOC PS 1, Medium Density Overlay.
- C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
 - a. Formica Corporation.
 - b. International Paper; Decorative Products Div.
 - c. Laminart.
 - d. Pioneer Plastics Corp.
 - e. Westinghouse Electric Corp.; Specialty Products Div.
 - f. Wilsonart International; Div. of Premark International, Inc.
- D. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.
- E. Adhesive for Bonding Plastic Laminate: PVA.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Door Hardware (Scheduled by Describing Products)."
- B. Hardware Standard: Comply with BHMA A156.9 for items indicated by referencing BHMA numbers or items referenced to this standard.
- C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing.
- D. Back-Mounted Pulls: BHMA A156.9, B02011.
- E. Door Pulls: Continuous "Hafele" Aluminum.
- F. Catches: Magnetic catches, BHMA A156.9, B03141
- G. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- H. Drawer Slides: Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings, BHMA A156.9, B05091, and rated for the following loads:
 - 1. Box Drawer Slides: 100 lbf (440 N).
 - 2. File Drawer Slides: 200 lbf (890 N).
 - 3. Pencil Drawer Slides: 45 lbf (200 N).
 - 4. Keyboard Slide: 75 lbf (330 N).
 - 5. Trash Bin Slides: 150 lbf (670 N).
- I. Grommets for Cable Passage through Countertops: 2-inch (51-mm), molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Product: Subject to compliance with requirements.
- J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated. Below are examples only. Revise to suit Project. If more than one finish is required, indicate location of each here or on Drawings. See Evaluations.
 - 1. Satin Stainless Steel: BHMA 630.
- K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.4 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

- B. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.
- C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

END OF SECTION

2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Provide Premium grade interior woodwork complying with the referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- D. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
 - 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).
- E. Complete fabrication, including assembly, [finishing,] and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- F. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

2.6 PLASTIC-LAMINATE CABINETS

- A. Quality Standard: Comply with AWI Section 400 requirements for laminate cabinets.
- B. Quality Standard: Comply with WIC Section 15.

- C. Grade: Premium.
- D. AWI Type of Cabinet Construction as indicated.
- E. WIC Construction Style: Style A, Frameless.
- F. WIC Construction Type: Type I, multiple self-supporting units rigidly joined together.
- G. WIC Door and Drawer Front Style: Flush overlay.
- H. Reveal Dimension: As indicated.
- I. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
 - 1. Horizontal Surfaces Other Than Tops: HGS
 - 2. Postformed Surfaces: HGP].
 - 3. Vertical Surfaces: HGS.
 - 4. Edges: HGS
- J. Materials for Semi exposed Surfaces: Provide surface materials indicated below:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS
 - 2. Drawer Sides and Backs: Solid-hardwood lumber.
 - 3. Drawer Bottoms: Hardwood plywood.
- K. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements: Retain one of three subparagraphs below. If retaining first, indicate colors, patterns, and finishes in a separate schedule.
 - 1. Match Architect's sample.
 - a. Solid colors.
 - b. Solid colors with core same color as surface.
 - c. Wood grains.

2.7 PLASTIC-LAMINATE COUNTERTOPS

- A. Quality Standard: Comply with AWI Section 400 requirements for high-pressure decorative laminate countertops.
- B. Quality Standard: Comply with WIC Section 16.
- C. Grade: Premium.
- D. High-Pressure Decorative Laminate Grade: HGP.
- E. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. Match Architect's sample.
 - a. Solid colors.
 - F. Grain Direction: Parallel to cabinet fronts.
 - G. Edge Treatment: As indicated.
 - H. Core Material: Particleboard.
 - I. Core Material at Sinks: Particleboard.
- 2.8 SHOP FINISHING
- A. Quality Standard: Comply with AWI Section 1500, unless otherwise indicated.
 - B. Quality Standard: Comply with WIC Section 25, unless otherwise indicated.
 1. Grade: Provide finishes of same grades as items to be finished.
 - C. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
 - D. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative overlay.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb, including tops, to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with recommendations of chemical treatment manufacturer, including those for adhesives used to install woodwork.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails [or finishing screws] for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
 - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.
 - 4. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 - 2. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 3. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
 - 4. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- H. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed.

Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in shop.

- I. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END SECTION 06402

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concealed and exposed fiberglass building insulation.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of insulation product specified.
- C. Product test reports from and based on tests performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, water absorption, and other properties, based on comprehensive testing of current products.
- D. Research or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence compliance of insulations with building code in effect for Project.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturers written instructions for handling, storing, and protecting during installation.
- B. Protect insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering insulation products that may be incorporated in the work include, but are not limited to, the following:
 - 1. Glass-Fiber Insulation:
 - a. CertainTeed Corporation.
 - b. Knauf Fiber Glass GmbH.
 - c. Owens-Corning Fiberglas Corporation.
 - d. Schuller International, Inc.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Unfaced Mineral-Fiber Blanket Insulation: Thermal insulation combining fibers of type described below with a thermoset resin to comply with ASTM C 665, Type I (blankets without membrane facing).
 - 1. Material Standard: ASTM C 655, Type I and ASTM C 991, Type I
 - 2. Mineral-Fiber Type: Fibers manufactured from inorganic glass.
 - 3. Fire Resistance: Fire Hazard Classification: UL 723, ASTM E 84 and NFPA 255.

4. Surface-Burning Characteristics: Maximum flame-spread 25 smoke-developed 50.
 5. Non-combustibility: ASTM E 136.
 6. Thermal Resistance: ASTM C 518, ASTM C 177.
 7. Moisture Absorption: ASTM C 665. Not greater than 0.2% by volume or by weight.
 8. Corrosiveness: Meeting requirements of ASTM C 665.
 9. Fungi Resistance: Meeting requirements of ASTM C 1338.
 10. Odor Emission: Meeting requirements of ASTM C 1304.
- C. Faced Mineral-Fiber Blanket Insulation: Thermal insulation combining fibers of type described below with thermoset resins and a flame resistant foil-scrim-kraft (FSK) facing adhered to the glass fiber, and comply with the following:
1. Material Standard: ASTM C 533, Type I and ASTM C 655, Type III, Class A Category 1.
 2. Mineral-Fiber Type: Fibers manufactured from inorganic glass.
 3. Fire resistance: Surface Burning Characteristics ASTM E 84, UL 723 and NFPA 255.
 4. Surface-Burning Characteristics: Maximum flame-spread 25 smoke-developed 50.
 5. Non-Combustible: ASTM E 136 (Passing).
 6. Thermal Performance: ASTM C 177 and ASTM C 518.
 7. Maximum Use Temperature: ASTM C 411, 250 degrees F.
 8. Water Vapor Sorption: ASTM C 1104 less than 3% by weight.
 9. Water Vapor Permeance: Permeance of facing – less than 0.02 perms.
 10. Corrosiveness: ASTM C 665 (passing).
 11. Fungi Resistance: ASTM C 1338 (Passing).
 12. Odor Emission: ASTM C 1304 (Passing)

2.3 SAFING INSULATION AND ACCESSORIES

- A. Calking Compound: Material approved by manufacturer of safin insulation for sealing edge of insulation filling void above partition against penetration of smoke.

2.5 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors with Washers: Plate formed from perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square, welded to projecting steel spindle with a diameter of 0.105 inch (2.67 mm) and length capable of holding insulation of thickness indicated securely in position with 1-1/2- inch- (38-mm-) square or diameter self-locking washers complying with the following:
 - 1. Washers formed from 0.016-inch- (0.41-mm-) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than in place.
- B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain 1-inch (25-mm) air space between face of insulation and substrate to which anchor is attached.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

3.3 INSTALLATION - GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice and snow.

- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement. Apply single layer of insulation to produce thickness indicated.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturers written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
 - 1. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3.6 PROTECTION

- A. General: Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END 07210

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes sheet metal flashing and trim where not called out in other sections for the following:
 - 1. Wall-drainage systems.
 - 2. Roof drainage system (where not called out in other Sections)
 - 3. Exposed trim, gravel stops, and fasciae (where not called out in other Sections)
 - 4. Copings.
 - 5. Metal flashing.

1.3 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
- C. Samples: For each exposed finish.

PART 2 - PRODUCTS

2.1 METALS

- A. Stainless-Steel Sheet: ASTM A 167, Type 304, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 24 gauge, 0.0250 inch (0.65 mm) thick.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than strength and durability of alloy and temper designated below:
 - 1. Extruded aluminum: ASTM B 221 (ASTM B 221M), alloy 6063-T52, with a minimum thickness of 0.080 inch for primary legs of extrusions that are anodized, unless otherwise indicated.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.
- B. Stainless-Steel Welding Rods: Type recommended by stainless-steel sheet manufacturer for type of metal sheets furnished.
- C. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- D. Asphalt Mastic: SSPC-Paint 12, solvent-type, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.
- E. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- F. Elastomeric Sealant: As recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements specified in Division 7 Section "Joint Sealants."
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.
- H. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- I. Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper, FS UU-B-790, Type I, Style 1b.
- J. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.
- K. Metal Accessories: Sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
- L. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.3 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate units to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, material, metal thickness, and other characteristics of item indicated.
- B. Fabricate units that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

- C. Form exposed sheet metal without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
- D. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- E. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- F. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- H. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- I. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- J. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
 - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but not less than thickness of metal being secured.
- K. Aluminum Extrusion Units: Fabricate with formed or extruded-aluminum joint covers for installation behind main members where possible. Fabricate mitered and welded corner units.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual."
 - 2. Anchor units of Work securely in place, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

- B. Install exposed units that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- C. Install units to fit substrates and to result in waterproof and weather-resistant performance.
- D. Expansion Provisions: Accommodate thermal expansion of exposed sheet metal. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pre-tinned surface would show in finished Work.
 - 1. Pre-tinning is not required for the following metals:
 - a. Lead.
 - b. Lead-coated copper.
 - 2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
 - 1. Use joint adhesive for nonmoving joints specified not to be soldered.
- G. Seams: Install flat-lock seams at nonmoving seams. Tin edges to be seamed, form seams, and solder.
- H. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
 - 1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install slip-sheet of red-rosin paper and course of polyethylene underlayment.
 - 2. Bed flanges of Work in thick coat of roofing cement where required for waterproof performance.
- I. Install reglets to receive counterflashing according to the following requirements:
 - 1. Where reglets are shown in concrete, furnish reglets for installation under Division 3 Section "Pre-Cast Concrete."

- J. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.
- K. Roof-Drainage System (NOT USED): Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain flashing installation with roof-drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.
- L. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.
- M. Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 - 2. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.
- N. Immediately after installation, clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes sealants for the following areas not covered in other sections of these specifications:
 - 1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces.
 - 2. Exterior joints in horizontal traffic surfaces.
 - 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 4. Interior joints in horizontal traffic surfaces.
- B. See Division 8 Section "Glazing" for glazing sealants.

1.3 SUBMITTALS

- A. Product Data: For each joint sealant product indicated.
- B. Samples: For each joint sealant product indicated.
- C. Sealant compatibility and adhesion test reports.
- C. Preconstruction field-adhesion test reports.
- D. Product certificates.

1.4 QUALITY ASSURANCE

- A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates using test method indicated in Part 3 "Field Quality Control" Article.
- C. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- D. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 WARRANTY

- A. Special Installer's Warranty: Written warranty in which Installer agrees to repair or replace elastomeric joint sealants that do not meet requirements specified in this Section or fail in adhesion within specified warranty period two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants, General: ASTM C 920.
 - 1. Continuous-Immersion Sealants: For immersion in water, products tested according to ASTM C 1247, including initial six-week immersion period without failing in adhesion or cohesion when tested with substrates indicated.
 - 2. Sealants for Contact with Food: Comply with 21 CFR 177.2600.
- B. Mildew-Resistant Silicone Sealant:
 - 1. Products:
 - a. Dow Corning; 786 Mildew Resistant.
 - b. GE Silicones; Sanitary 1700.
 - c. Pecora Corporation; 898 Silicone Sanitary Sealant.
 - d. Tremco; Tremsil 600 White.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Exposure: Use NT (nontraffic).
 - 5. Substrates: Uses G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O joint substrates: Galvanized steel and ceramic tile.

- C. Multi-component Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:
 - 1. Products: Available products include the following:
 - a. Vulkem 922; Mameco International.
 - b. Dynatrol II; Pecora Corporation.
 - c. Sikaflex - 2c NS; Sika Corporation.
 - d. DYmeric 511; Tremco.
 - 2. Type and Grade: M (multi-component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
 - 5. Use Related to Exposure: NT (nontraffic).
 - 6. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel, ceramic tile, and wood.
 - 7. Applications: Exterior non-traffic joints.
 - D. Multi-component Pourable Urethane Sealant : Where joint sealants of this type are indicated, provide products complying with the following:
 - E. Products: Available products include the following:
 - 1. Vulkem 245/255; Mameco International.
 - 2. Pourthane; W.R. Meadows, Inc.
 - 3. NR-200 Urexpan; Pecora Corporation.
 - 4. NR-300 Urexpan, Type M; Pecora Corporation.
 - 5. Sikaflex - 2c SL; Sika Corporation.
 - 6. THC-900/901; Tremco.
 - F. Type and Grade: M (multi-component) and P (pourable).
 - G. Class: 25.
 - H. Use Related to Exposure: T (traffic)
 - I. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - 1. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel, ceramic tile, and wood.
 - J. Applications: Exterior traffic joints.
- 2.4 Single-Component Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:
- A. Products: Available products include the following:
 - 1. Vulkem 921; Mameco International.
 - 2. Dynatrol I; Pecora Corporation.

3. DyMonic; Tremco.
 - B. Type and Grade: S (single component) and NS (nonsag).
 - C. Class: 12-1/2 or 25.
 - D. Use Related to Exposure: NT (nontraffic).
 - E. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 1. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel, ceramic tile, and wood.
 - F. Applications: Exterior nontraffic joints.
- 2.5 Single-Component Pourable Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:
- A. Products: Available products include the following:
 1. Vulkem 45; Mameco International.
 2. Vulkem Nova 300 SSL; Mameco International.
 3. NR-201; Pecora Corporation.
 - B. Type and Grade: S (single component) and P (pourable).
 - C. Class: 25.
 - D. Use Related to Exposure: T (traffic)
 - E. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 1. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel, ceramic tile, and wood.
 - F. Applications: Exterior traffic joints.
- 2.6 SOLVENT-RELEASE JOINT SEALANTS
- A. Butyl-Rubber-Based Solvent-Release Joint Sealant: ASTM C 1085.
 1. Products:
 - a. H.B. Fuller Company; PTI [707] [757].
 - b. Pecora Corporation; BC-158.
 - c. Tremco; Tremco Butyl Sealant.
 2. Application: Bedding for metal thresholds.
- 2.7 LATEX JOINT SEALANTS
- A. Latex Sealant: Where joint sealants of this type are indicated, provide products complying with the following: ASTM C 834.
 1. Products:
 - a. Ohio Sealants, Inc.; LC 160 All Purpose Acrylic Caulk.

- b. Pecora Corporation; AC-20.
- c. Tremco; Tremflex 834.

2. Applications: Non-moving interior joints.

2.8 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products:

- a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
- b. USG Corp., United States Gypsum Co.; SHEETROCK Acoustical Sealant.

2.9 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- 1. Type C closed-cell material with a surface skin
 - 2. Type O open-cell material.
 - 3. Type B, bicellular material with a surface skin.
 - 4. Type: Any material indicated above.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
- B. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
- C. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
 - 1. Concrete.
 - 2. Masonry.
 - 3. Unglazed surfaces of ceramic tile.
- D. Remove laitance and form-release agents from concrete.
- E. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - 1. Metal.
 - 2. Glass.
 - 3. Porcelain enamel.
 - 4. Glazed surfaces of ceramic tile.
- F. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- G. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 PREPARATION

- A. General: Comply with joint sealant manufacturers written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
- F. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes steel frames for flush wood doors.**
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 8 Section "Flush Wood Doors" for solid-core wood doors installed in steel frames.
 - 2. Division 8 Section "Door Hardware" for door hardware and weather-stripping.
 - 3. Division 9 Section "Gypsum Board Assemblies" for spot grouting frames in gypsum board partitions.
 - 4. Division 9 Section "Painting" for field painting primed doors and frames.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
 - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.4 QUALITY ASSURANCE

- A. Provide frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.
- B. Fire-Rated Door Assemblies: **(NOT USED)** Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.
- B. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 (ASTM A 526M), commercial quality, or ASTM A 642 (ASTM A 642M), drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G 60 (ASTM A 525M, with Z 180 or ZF 180) coating designation, mill phosphatized.
- C. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.2 DOORS **(NOT USED)**

- A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:
1. Interior Doors: Grade II, heavy-duty, Model 1, full flush design, minimum 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet faces.
 2. Exterior Doors: Grade III, extra heavy-duty, Model 1, full flush design, minimum 0.0635-inch- (1.6-mm-) thick galvanized steel sheet faces.

2.3 FRAMES

- A. Provide metal frames for doors, transoms, borrowed lights, glass block panels, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet.
1. Fabricate frames with mitered or coped and continuously welded corners.
 2. Fabricate frames for interior openings over 48 inches (1220 mm) wide from 0.0598-inch- (1.5-mm-) thick steel sheet.
 3. Form exterior frames from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.
- B. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- C. Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- D. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

2.4 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
 - 1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
 - a. Rigid polyurethane conforming to ASTM C 591.
 - b. Rigid polystyrene conforming to ASTM C 578.
 - c. Unitized steel grid.
 - d. Vertical steel stiffeners.
 - e. Rigid mineral fiber with internal sound deadener on inside of face sheets.
 - 2. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors. Not more than 3/4 inch (19 mm) at bottom.
 - a. Fire Doors: Provide clearances according to NFPA 80.
- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.
- C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- E. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.
 - 1. At exterior locations.
- F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
 - 1. Unless otherwise indicated, provide thermal-rated assemblies with U-value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better.

- H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
 - 1. For concealed overhead door closers, provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames, as applicable.
- I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- J. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- K. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.
 - 1. Provide nonremovable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
 - 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.5 FINISHES - GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.
- C. Apply primers to doors and frames after fabrication.

2.6 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
 - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for reglazing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.
 - 1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

2.7 STEEL SHEET FINISHES

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.
- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 - 1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
 - 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
 - 3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 - 4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
 - 5. Install fire-rated frames according to NFPA 80.
- C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.
 - 1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
 - 2. Smoke-Control Doors: Comply with NFPA 105.

3.2 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes solid and hollow core doors as follows:
 - 1. Doors with wood-veneer faces and factory finishing.
 - 2. Doors with medium-density overlay faces.
 - 3. Doors with hardboard faces.
 - 4. Doors with plastic-laminate faces.
 - 5. Factory fitting wood doors to frames and factory machining for hardware.
- B. See Division 6 Section "Finish Carpentry" for wood door frames.
- C. See Division 8 Section "Glazing" for glass view panels in flush wood doors.

1.2 SUBMITTALS

- A. Product Data: For each type of door. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; mortises, holes, and cutouts; requirements for veneer matching; factory finishing; fire ratings; and other pertinent data.
- C. Samples: For each face material and finish.

1.3 QUALITY ASSURANCE

- A. Quality Standard: Comply with NWWDA I.S.1-A, "Architectural Wood Flush Doors." AWI's "Architectural Woodwork Quality Standards Illustrated." WIC's "Manual of Millwork."
- B. Fire-Rated Wood Doors: Doors that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated.
 - 1. Test Pressure: Test at atmospheric pressure after 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Algoma Hardwoods Inc.
 - 2. Ampco Products, Inc.
 - 3. Buell Door Company.
 - 4. Chappell Door Co.
 - 5. Eagle Plywood & Door Manufacturing, Inc.
 - 6. Eggers Industries; Architectural Door Division.
 - 7. GRAHAM Manufacturing Corp.
 - 8. Haley Brothers, Inc.
 - 9. Ideal Wood Products, Inc.
 - 10. IPIK Door Company.
 - 11. Lambton Doors.
 - 12. Marlite.
 - 13. Mohawk Flush Doors, Inc.
 - 14. Oshkosh Architectural Door Co.
 - 15. Poncraft Door Co.
 - 16. Southwood Door Co.
 - 17. Vancouver Door Company, Inc.
 - 18. VT Industries Inc.
 - 19. Weyerhaeuser Company.

2.2 DOOR CONSTRUCTION - GENERAL

- A. Doors for Transparent Finish:
 - 1. Grade: Premium, with Grade A faces.
 - 2. Species and Cut: Red Oak, Sliced.
 - 3. Match between Veneer Leaves: Pleasing match.
 - 4. Assembly of Veneer Leaves on Door Faces: Balanced match.
 - 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.

2.3 SOLID- CORE DOORS

A. Interior Veneer-Faced Solid-Core Doors:

1. Core: Particleboard core.
2. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

B. Particleboard Cores:

1. Particleboard: ANSI A208.1, Grade LD-1.
2. Blocking: Provide wood blocking at particleboard-core doors as follows:
 - a. 5-inch (125 mm) top rail blocking at doors indicated to have closers.
 - b. 5-inch (125 mm) bottom rail blocking at doors indicated to have kick, mop or armor plates.
 - c. 5-inch (125 mm) mid-rail blocking at doors indicated to have exit devices.

C. Fire-Rated Doors **(NOT USED)**:

1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
2. Edge Construction: Manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance.
3. Edge Construction: Intumescent seals concealed by outer stile matching face veneer, and laminated backing for improved screw-holding capability and split resistance.
4. Pairs: Furnish formed-steel edges and astragals with intumescent seals for pairs of fire-rated doors, unless otherwise indicated.
5. Pairs: Provide fire-rated pairs with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

2.4 FABRICATION

- A. Fabricate doors in sizes indicated for Project-site fitting.
- B. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- C. Factory machine doors for hardware that is not surface applied.
 1. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Louvers: Factory install louvers in prepared openings.

2.5 FACTORY FINISHING

- A. General: Finish doors at factory that are indicated to receive transparent finish.
- B. Grade: Custom.
- C. Finish: AWI TR-6 catalyzed polyurethane.
- D. Staining: Match sample.
- E. Effect: Filled finish.
- F. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine installed door frames before hanging doors.
 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.
 - a. Comply with NFPA 80 for fire-rated doors.
 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
 3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.

- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at Project site.

3.3 ADJUSTING AND PROTECTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

END SECTION

PART 1 - GENERAL

1.1 REFERENCE

The publication below forms a part of this specification.
UNDERWRITERS LABORATORY UL 752 BULLET RESISTING EQUIPMENT
11th edition dated Sept. 5, 2005

1.2 DESIGN

Through design, manufacturing technique and material application, door and frame shall be of the "non-ricochet type". This design is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration. The ballistic encapturing barrier shall be UL LISTED Bullet Resistant Composite manufactured by Armortex.

PROTECTION LEVEL SHALL BE UL LEVEL 3 (.44 MAGNUM-3 SHOTS)

The door and frame must be manufactured by the same firm. Units must be manufactured in strict accordance with specifications, design and details. Door and frame shall be mortised at the factory for template hardware in accordance with the approved hardware schedule. Templates are to be provided to the door manufacturer by the hardware contractor. Where surface mounted hardware is to be applied, all drilling and taping shall be performed at the jobsite by the installing contractor. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. All welds shall be in accordance with the requirements and standard practices of the American Welding Society. All exposed welds shall be ground flush and finished smooth.

1.3 SUBMITTALS

The following shall be submitted in accordance with Division 1 and the SPECIAL CONTRACT REQUIREMENTS. Submit for approval prior to fabrication, VERIFICATION OF UL LISTING OF BULLET RESISTANT COMPOSITE, catalog cuts, shop drawings, specifications, frame profiles, size, type and spacing of frame anchors, reinforcement size and locations, details of joints and connections, welding details and printed data in sufficient detail to indicate compliance with the contract documents. Provide proof of possession of PRODUCT LIABILITY INSURANCE in an amount not less than five million U.S. dollars. Manufacturer's instructions for installation and cleaning glazing material. Provide verification of compliance with ASTM E119-00a One Hour Fire Rating from a recognized testing laboratory for the ballistic protection barrier.

PART 2 – PRODUCTS

1.4 WARRANTY

All materials and workmanship shall be warranted against defects for a period of one (1) year from date of receipt at job site.

2.1 MANUFACTURER

The door and frame to be model, size, etc. as indicated on the contract drawings; manufactured by Armortex, Schertz, Texas. Phone: (210) 661-8306, (800) 880-8306, Fax: (210) 661-8308. If in compliance with all aspects of this specification products by these additional manufactures may be acceptable:

Eggers Industries	920-793-1351
Algoma Hardwoods	920-487-5221
Diebold, Inc.	800-999-3600

2.2 DOOR

Bullet resistant solid core wood door shall be of the "non-ricochet type" complete with unfinished face veneer. Door unit shall be supplied pre hung with a Continuous Gear Hinge on a steel frame. If bullet resistant transparent armor is required for door vision panels, they shall be standard products furnished by the door manufacturer and must be a UL Listed material of the same ballistic level as the door assembly. All stiles and rail edges shall be solid wood of the veneer variety, a minimum of 3/8" thick.

2.3 FRAME

Frames shall be a protection level equal to the door. Frame shall be of a "non-ricochet type" design, constructed of 16 ga. commercial grade steel lined with UL LISTED Bullet Resistant Composite Steel shall be free of scale, pitting, coil breaks or other surface defects. Finish work shall be neat and free of defects. frames shall be welded. Knocked down and mechanical joints are unacceptable. Standard manufacturing tolerances shall be +/- 1/16" for frame opening width, height, diagonal dimensions and overall width and height (outside to outside).

2.4 FINISH

Cold rolled steel is factory prime painted gray, the continuous hinge is clear anodized aluminum and the door is to be unfinished plain sliced red oak veneer. Field paint and finish in accordance with and as directed in the Finish Section 9 of these specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

In accordance with manufacturer's instructions.

3.2 PROTECTION

It shall be the responsibility of the contractor to see that any scratches or disfigurement caused in shipping or handling of the products are properly cleaned and touched up. Store the products in a dry heated location, covered and ventilated to protect them from damage. Repair damaged units prior to completion and acceptance of the project or replace with new, as directed.

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SECTION 08212
BULLET RESISTANT WOOD DOOR AND FRAME

3.3 CLEANING

Upon completion, clean units thoroughly; remove all smears and other unsightly marks.
Clean glazing products in accordance with the manufacturer's instructions.

END OF SECTION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish and install aluminum entrance doors and entrance door frames complete with hardware and related components as shown on the drawings and specified in this section.
- B. All doors shall be EFCO® Series T300 Medium Stile Tie Rod Entrance Door. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
 - 1. A sample door (size and configuration) as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.04.
- C. Glass and Glazing
 - 1. All units shall be factory glazed. Reference Section 088100 for Glass and Glazing
- D. Single Source Requirement
 - 1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 Related Work

- D. Section 08520— Aluminum Windows
- E. Section 08800- Glazing

1.03 Items Installed but Not Furnished

- A. Structural support of the framing, wood framing, structural steel, and final cleaning.

1.04 Laboratory Testing and Performance Requirements

- A. Test Units
 - 1. Air test unit shall be a minimum size of 36" (914 mm) x 84" (2134 mm).
- B. Test Procedures and Performances
 - 1. Entrance doors shall conform to all requirements for the door type referenced in 1.01 B. In addition, the following specific performance requirements shall be met.
 - 2. Air Infiltration Test
 - a. With door sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf (75 Pa).
 - b. Air infiltration shall not exceed .30 cfm/SF (1.52 l/s·m²) of unit, for single doors.
- C. Project Wind Loads
 - 1. The system shall be designed to withstand the following loads normal to the plane of the wall: (10 SF)

ASCE 7-05, 120 mph, Category IV,
Importance factor = 1.15, Exposure B, Enclosed Building, GCpi = +/-0.18.
Edge Zone (within 6 ft of exterior wall corners): +29.7, -39.7 psf
Interior zone: +29.7, -32.2 psf

- D. Additional test criteria for small missile impact
 - 1. Small Missile Level A Impact Test conducted on test units in accordance with TAS 201 or ASTM E 1886/E 1996. Upon completion of the missile impact tests, the test units shall be tested in accordance with TAS 203 or ASTM E 1996 cyclic load test.
- E. Additional test criteria for large missile impact
 - 1. Large Missile Level (C or D) Impact Test conducted on test units in accordance with TAS 201 or ASTM E 1886/E 1996. Upon completion of the missile impact tests, the test units shall be tested in accordance with TAS 203 or ASTM E1996 cyclic load test.

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the entrance door manufacturer's letter of certification stating that the tested door meets or exceeds the referenced criteria for the appropriate AAMA door type.

1.07 References

1.08 Submittals

- A. Contractor shall submit shop drawings, finish samples, test reports, and warranties.
 - 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.09 Warranties

- A. Total Entrance Door System
 - 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total door installation which includes that of the manufacturer supplied doors, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, and structural adequacy as called for in the specifications and approved shop drawings.
 - 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at his expense during the warranty period.

PART 2 PRODUCTS

2.01 Material

- A. Aluminum
 - 1. Extruded aluminum shall be 6063-T6 alloy and temper.
- B. Fasteners
 - 1. All exposed fasteners shall be aluminum or stainless steel.
- C. Glass. See Specification Section 08800.

2.02 Fabrication

- A. General

1. Major portions of the door sections shall have .100" (2.5 mm) nominal wall thickness at top rails and .125" (3 mm) nominal wall thickness at door stiles and bottom rails. Glazing stop sections shall have .050" (1.2 mm) wall thickness.
- B. Entrance Doors
 1. Door stiles shall be no less than 3 1/2" (79 mm) wide, not including glass stops.
 2. Door corner construction shall utilize a dovetail joint at corners. Fasteners shall include: interlocking concealed rail adaptors and 3/8-16 zinc coated steel tie rods with serrated lock nuts.
 3. All doors shall have an adjusting mechanism in the top rail to provide for minor clearance adjustments.
 4. Door pairs shall be dual sealed at meeting stiles with poly-pile weather stripping.
- C. Door stops shall include a bulb weather-strip that complies with ASTM E 2203 specification.
- D. Glazing
 1. All units shall be dry glazed with extruded pressure fitting aluminum glazing stops, and a gasket that complies with ASTM E 2203 specification.
- E. Finish
 1. Anodic
 - a. Finish all exposed areas of aluminum doors and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-A41. Color shall be Bronze Anodized, Arch. Class I. AAMA Guide Spec. 611-98.

2.03 Hardware

- A. Purchase Doors blank and prepped for Finish Hardware Group #02 in Specification Section 08710 Finish Hardware.

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions
 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align entrance door faces in a single plane for each wall plane, and erect doors and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust doors for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Adjusting and Cleaning

- A. After completion of door installation, doors shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish and install aluminum architectural windows complete with hardware and related components as shown on drawings and specified in this section.
- B. All windows shall be EFCO® Series 2901 Thermal Fixed configuration or approved equivalent. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
 - 1. A sample window, 24" (610 mm) x 36" (919 mm) single unit, as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.04.
- C. Glass and Glazing
 - 1. All units shall be factory glazed.

1.02 RELATED WORK BY MANUFACTURER

- A. Section 08413 – Glazed Aluminum Curtain Walls.
- B. Section 08800 – Glazing

1.03 ITEMS INSTALLED BUT NOT FURNISHED

- A. Structural support of the framing, wood framing, structural steel, and final cleaning.

1.04 LABORATORY TESTING AND PERFORMANCE REQUIREMENTS

- A. Test Units
 - 1. Air, water, and structural test unit shall conform to requirements set forth in ASTM E 283, ASTM E 331, and ASTM E 330 with manufacturer's standard locking/operating hardware and glazing configuration.
 - 2. Thermal test unit sizes shall consist of a fixed window.
- B. Test Procedures and Performances
 - 1. Windows shall conform to all the following specific performance requirements.
 - 2. Air Infiltration Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
 - b. Air infiltration shall not exceed .06 cfm/SF (.30 l/s·m²) of unit.
 - 3. Water Resistance Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 12.0 psf (575 Pa).
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 29.7 psf, positive and 39.7 psf negative pressure.
 - b. No member shall deflect over L/175 of its span.
 - 5. Uniform Load Structural Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 42.7 psf, both positive and negative.
 - b. At conclusion of test there shall be no glass breakage, permanent damage to

fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.

6. Condensation Resistance Test (CRF)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less 60 (frame) and 69 (glass) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.
7. Thermal Transmittance Test (Conductive U-Value)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.42 BTU/hr•ft²•°F (2.38 W/m²•K) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.
8. Thermal Transmittance Test (Conductive U-Value)
 - a. With ventilators closed and locked, test unit in accordance with NFRC-102.
 - b. Conductive thermal transmittance (U-Value) shall not be more than 0.40 BTU/hr•ft²•°F (2.27 W/m²•K) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.
- C. Project Wind Loads
 1. The system shall be designed to withstand the following loads normal to the plane of the wall: (10 SF)

ASCE 7-05, 120 mph, Category IV,
Importance factor = 1.15, Exposure B, Enclosed Building, GCpi = +/-0.18.
Edge Zone (within 6 ft of exterior wall corners): +29.7, -39.7 psf
Interior zone: +29.7, -32.2 psf

- D. Additional test criteria for small missile impact
 1. Small Missile Level A Impact Test conducted on test units in accordance with TAS 201 or ASTM E 1886/E 1996. Upon completion of the missile impact tests, the test units shall be tested in accordance with TAS 203 or ASTM E 1996 cyclic load test.
- E. Additional test criteria for large missile impact
 1. Large Missile Level (C or D) Impact Test conducted on test units in accordance with TAS 201 or ASTM E 1886/E 1996. Upon completion of the missile impact tests, the test units shall be tested in accordance with TAS 203 or ASTM E 1996 cyclic load test.

1.06 FIELD TESTING AND PERFORMANCE REQUIREMENTS

- A. Windows shall be field tested in accordance with AAMA 502, "Voluntary Specification for Field Testing of Windows and Sliding Glass Doors," using Test Method A.
 1. Test one additional window or two percent of the window installation, whichever is greater,
for air infiltration and water penetration as specified.
 2. Cost for all successful tests, both original and retest shall be paid by the General Contractor. All unsuccessful tests, both original and retest, shall be paid by the responsible contractor.
 3. Testing shall be by an AAMA accredited testing agency selected by the window manufacturer and employed by the responsible contractor.
 4. Air infiltration field tests shall be conducted at the same uniform static test pressure as the laboratory test unit. The Maximum allowable rate of air leakage shall not

exceed 1.5 times the laboratory test unit for hardware and glazing types consistent with the laboratory test unit. Performance values may be reduced due to deviations from the laboratory test unit such as product size, configuration, hardware selected, and glazing configuration. The field test air leakage rate shall not exceed 1.5 times the maximum allowable laboratory performance specified in the testing criteria listed in Section 1.05.A.1 for any configuration.

5. Water penetration field tests shall be conducted at a static test pressure of 2/3 of the laboratory test performance values for hardware and glazing types consistent with the laboratory test unit. Performance values may be reduced due to deviations from the laboratory test unit such as product size, configuration, hardware selected, and glazing variations. The field test water test pressure shall not be less than 2/3 of the minimum allowable laboratory performance specified in the testing criteria listed in Section 1.05.A.1 for any configuration.

1.07 QUALITY ASSURANCE

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate ASTM E 283, ASTM E 331, and ASTM E 330 window type.
- C. All products shall have Florida Product Approval numbers compliant with Rule 9B-72. Products configured, sized or anchored differently than the approved specimen must follow the guidelines of Florida Statute 553.8425. Submit supplementary testing or engineer's calculations to substantiate any deviation.
- D. All products shall bear a permanent label affixed to the product according to 2007 FBC.

1.09 SUBMITTALS

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.10 WARRANTIES

- A. Total Window System
 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at his expense during the warranty period.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Aluminum
 1. Extruded aluminum shall be 6063-T6 alloy and tempered.
- B. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
 2. No thermal short circuits shall occur between the exterior and interior.
 3. Barrier material shall be poured-in-place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.
- C. Glass
1. See glazing section 08800 for glass requirements.

2.02 FABRICATION

- A. General
1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .125" (3 mm).
 2. Depth of frame and vents shall not be less than 4 1/2" (114 mm).
- B. Frame
1. Frame components shall be mechanically fastened.
- C. Glazing
1. Window System shall be glazed to comply with the requirements of the 2007 Florida Building Code, Section 1609 Wind Loads and Chapter 24 Glass and Glazing.
- D. Finish
1. Anodic
 - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-A41. Color shall be Bronze Anodized, Arch Class 1. AAMA Guide Spec. 611-98.

PART 3 EXECUTION

3.01 INSPECTION

- A. Job Conditions
1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 INSTALLATION

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- D.

3.03 ANCHORAGE

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 PROTECTION AND CLEANING

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE

The publication below forms a part of this specification
UNDERWRITERS LABORATORY UL 752 11th Edition
Standard for Bullet Resisting Equipment dated Sept. 5, 2005

1.2 DESIGN

A Transaction window designed and built in a manner that provides a completely assembled, finished unit with a dip tray and shelf, to be installed in a finished opening.

THE NATURAL VOICE FRAME MUST BE UL LISTED LEVEL 3.

GLAZING IS TO BE UL LISTED LEVEL 3

Provide for two way "natural voice" communication permitted by the design of the vertical side frames and glazing technique. Units must be manufactured in strict accordance with the specifications, design and details. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. All welds shall be in accordance with the requirements and standard practices of the American Welding Society. All exposed welds shall be ground flush and finished smooth.

1.3 SUBMITTALS

The following shall be submitted in accordance with Division 1 and the SPECIAL CONTRACT REQUIREMENTS: Catalog cuts, shop drawings, specifications, frame profiles, size, type and spacing of anchors, welding details, details of joints and connections. Provide VERIFICATION OF UL LISTING of natural voice frame, and printed data in sufficient detail to indicate compliance with the contract documents, for all components of the transaction window. Provide proof of possession of PRODUCT LIABILITY INSURANCE in an amount not less than five million U.S. dollars. Manufacturer's instructions for installation of the transaction window and cleaning of the glazing material.

1.4 WARRANTY

All material and workmanship shall be warranted against defects for a period of one (1) year from the date of receipt at the jobsite.

PART 2 PRODUCTS

2.1 MANUFACTURER

Transaction Window unit to be model SSTW of the size indicated on the contract drawings and manufactured by Armortex, Schertz, Texas. Phone: 210-661-8306, 800-880-8306, Fax: 210-661-8308. If in compliance with all aspects of this specification

BULLET RESISTANT TRANSACTION WINDOW(cont.)

Products by these additional manufactures may be acceptable:

Diebold, Inc. 800-999-3600
Ross Engineering 703-971-2442
Norshield Security Products 334-281-8440

2.2 FRAME

The vertical side of frames to be manufactured of 12 ga. stainless steel # 3 finish and drilled in at least four points on each side to permit the anchoring to structural members or mullion with an adjoining unit. The hole placement shall prohibit the removal of these anchoring or attaching devices from the opposite side of glazing. The top and bottom edges of the glazing to be capped with no less than 20 ga. stainless steel, with a # 3 finish. Frame shall not be of the hollow metal design. FRAME TO BE UL LISTED LEVEL 3. Aluminum frames are not acceptable.

2.3 GLAZING

The glazing to be of the protection level specified and must be UL Listed Laminated Glass.

2.4 SHELF

Provide a shelf not less than 2" thick with a recessed dip tray. The shelf to be full width of window and a minimum of 12" deep centered under the glazing covered with a black high pressure laminate.

2.5 DIP TRAY

Model RMDT1016 constructed of no less than 16 ga. stainless steel, # 3 finish 10" x 16" from the outside edge of flanges with a clear open depth under the glazing no less than 1 5/8".

PART 3 EXECUTION

3.1 INSTALLATION

Set windows in accordance with the manufacturer's printed recommendations. Proper anchoring device shall be determined by the material to be anchored to. All exposed anchor holes shall be used for anchoring. Repair damaged units prior to completion and acceptance of the project or replace with new units as directed by the architect.

3.2 PROTECTION

It shall be the responsibility of the contractor to see that windows are properly stored in a dry location and covered to protect them from damage before and after installation.

3.3 CLEANING

Upon completion, clean exposed surfaces of windows thoroughly in accordance with manufacturer's instructions.

END OF SECTION

PART I - GENERAL

1.01 WORK INCLUDED

- A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Hollow Metal Doors and Frames
- B. Aluminum Doors and Frames
- C. Wood Doors and Frames

1.03 DESCRIPTION OF WORK

- A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.
- B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
- C. All hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.
- D. Fire-Rated Openings:
 - 1. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80, NFPA Standards NO. 101, UBC 702 (1997) and UL10C. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.
 - 2. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating "Fire Exit Hardware".
- E. Fasteners:
 - 1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
 - 2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
 - 3. Insofar as practical, furnished concealed type fasteners for hardware units which have exposed screws shall be furnished with Phillips flat heads screws, finished to match adjacent hardware.
 - 4. Door closers and exit devices to be installed on wood or composite fire doors shall be attached with closed head through bolts (sex bolts).
- F. Florida Building Code (Latest edition)
 - 1. Provide Miami-Dade Notice of Authorization (NOA) if required by authority having jurisdiction require.
 - 2. Engineering Reports that opening meet requirement for wind load, water infiltration and impact as required in FBC

1.04 QUALITY ASSURANCE

- A. The supplier to be a directly franchised distributor of the products to be furnished and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and the general contractor at reasonable times during the course of work.
- B. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.
- C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.
- D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
- E. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.
- F. The hardware manufactures are to supply both a pre-installation class as well as a post-installation walk-thru. This is to insure proper installation and provide for any adjustments or replacements of hardware as required.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Wrap, protect finishing hardware items for shipment. Deliver to manufacturing contractors hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.06 WARRANTY

- A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer's warranty permits.
- B. Overhead door closers shall be warranted in writing, by the manufacturer, against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner.

PART II - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. To the greatest extent possible, obtain each kind of hardware from one manufacturer only.
- B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
1) Hinges	Ives	Hager, Stanley
2) Locks & Latches	Schlage Lock	Falcon Lock
3) Cylinders, Keys, Keying	Schlage Lock	Falcon Lock
4) Exit Devices	Von Duprin	Monarch Hardware
5) Door Closers	LCN	Dor-O-Matic
6) OH Stops/Holders	Glynn Johnson	Rixson
7) Wall Stops/Floor Stops, Flushbolts	Ives	Rockwood, Hager
8) Kick Plates	Ives	Rockwood, Hager
9) Threshold/ Weather-strip	National Guard	Pemko, Zero
10) Silencers	Ives	Rockwood, Hager
11) Key Cabinet	Lund	Key Control

- C. If material manufactured by other than that specified or listed herewith as an equal, is to be bid upon, permission must be requested from the architect seven (7) days prior to bidding. If substitution is allowed, it will be so noted by addendum.

2.02 FINISH OF HARDWARE:

- A. Exterior Hinges to be Stainless Steel (32D) and Interior hinges to be Satin Chrome (26D) Door Closers to be Aluminum, Locks to be Satin Chrome (26D). Exit Devices to be Satin Chrome (26D). Overhead Holders to be Satin Chrome (26D), Stainless Steel (32D) and the Thresholds to be Mill Finish Aluminum.

2.03 HINGES AND PIVOTS:

- A. Exterior butts shall be Stainless Steel. Butts on all out swinging doors shall be furnished with non-removable pins (NRP).
- B. Interior butts shall be as listed.
- C. Doors 5' or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2'6" in height or fraction thereof. Dutch door shall have two (2) butts per leaf.

2.04 KEYING:

- A. Locks and cylinders shall be Schlage Lock Company. All bittings shall be issued by lock manufacturer in order to create a grand master key system.
- B. Locks and cylinders to be construction master keyed in a manner that does not require the cylinders to be removed.

- C. Provide Two (2) each change keys per lock and Six (6) each construction master keys.

2.05 LOCKSETS:

- A. Locksets shall be Heavy Duty Cylindrical type, unless specified otherwise, in "AL" series, lever design as manufactured by Schlage.

- 1. Acceptable substitutions:

- A. Falcon Lock B series

2.06 EXIT DEVICES:

- A. All devices shall be Von Duprin 98 Series in types and functions specified. All devices must be listed under "Panic Hardware" in accident equipment list of Underwriters Laboratories. All labeled doors with "Fire Exit Hardware" must have labels attached and be in strict accordance with Underwriters Laboratories.
- B. All exit devices shall be tested to ANSI/BHMA A156.3 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 1,000,000 cycles must be provided.
- C. All surface strikes shall be roller type and come complete with a plate underneath to prevent movement. And shall be provided with a dead-latching feature to prevent latchbolt tampering.

- 1. Acceptable Substitutions:

- A. Monarch Hardware 18 Series

2.07 DOOR CLOSERS:

- A. All closers shall be LCN 1461 Series having non-ferrous covers, forged steel arms separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated.
- B. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
- C. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C.
- D. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed,

general speed, and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.

1. Acceptable Substitutions:
 - A. Dor-O-Matic SC80 series

2.08 TRIM AND PLATES:

- A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 32D finish. Kick plates to be 10" high, mop plates to be 4" high. All plates shall be two (2) inches less full width of door.
- B. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

2.09 DOOR STOPS:

- A. Door stops shall be furnished for all door to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Ives WS407 Series are preferred, but where not practical furnish floor stops equal to Ives FS436 or FS438 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson, 450 Series.

2.10 THRESHOLDS AND WEATHERSTRIP:

- A. Thresholds and weatherstrip shall be as listed in the hardware schedule.

2.11 DOOR SILENCERS:

- A. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

PART III - EXECUTION

3.01 INSTALLATION:

- A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.
- B. Contractor to provide a secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items that are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.
- C. No hardware is to be installed until the hardware manufactures have provided a pre-installation class. This is to insure proper installation of the specified products.

3.02 ADJUSTING AND CLEANING:

- A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

3.03 PROTECTION:

- A. Contractor shall protect hardware as it is stored on construction site in a covered and dry place.
- B. Contractor shall protect exposed hardware installed on doors during the construction phase.

3.04 KEY CABINET:

- A. Set up and index one (1) Key Cabinet that allows room for expansion for 150% of the number of keys for the project.

3.05 HARDWARE SCHEDULE:

- A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors; or for each single door.
- B. This hardware schedule prepared by.

IR – Security Technology
735 W. SR 434, Suite H
Longwood, FL 32750
Ph: 407-571-2000
Fax 407-571-2006

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes glazing for the following products and applications:

1. Windows.
2. Doors.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads:

ASCE 7-05, 120 mph, Category IV,
Importance factor = 1.15, Exposure B, Enclosed Building, GCpi = +/-0.18.
Edge Zone (within 6 ft of exterior wall corners): +29.7, -39.7 psf
Interior zone: +29.7, -32.2 psf
 - b. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
 2. Wind-borne debris: Comply with 2007 Florida Building Code Section 1609 Wind Loads.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from a maximum change (range) of 120 deg F (67 deg C), 180 deg F (100 deg C) in ambient and surface temperatures, respectively, acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- (13-mm-) wide interspace.

1.3 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glazing Schedule: Use same designations indicated on Drawings.
- C. Sealant compatibility and adhesion test reports.

1.4 QUALITY ASSURANCE

- A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Fire-Rated Assemblies: **(NOT INCLUDED)** Where glazing products are used in fire-rated assemblies, comply with requirements of specific assembly specified in other sections of these Specifications.
 1. Door Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
 2. Window Assemblies: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- C. Safety Glass (where required): Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
- D. Glazing Publications: Comply with recommendations of the following, unless more stringent requirements are indicated.
 1. GANA Publications: "Glazing Manual" and "Laminated Glass Design Guide."
 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."
- E. Insulating-Glass Certification Program: Permanently marked with certification label of Insulating Glass Certification Council

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by manufacturer, in which manufacturer agrees to furnish replacements for units that deteriorate from normal use by developing defects attributable to the manufacturing process, f.o.b. the nearest shipping point to Project site, within warranty period.
 1. Laminated Glass:

- a. Deterioration: Edge separation, delamination that materially obstructs vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - b. Warranty Period: 5 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
- 1. Warranty Period: **10** Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other articles including schedules where subparagraph titles below introduce lists, the following requirements apply for product selection:
- 1. Products: "Sungate 100" Azuria, insulated, Low-E glass, tinted bronze.
 - 2. Manufacturers: PPG Industries.

2.2 GLASS MATERIALS

- A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified.
- 1. Interlayer: Polyvinyl butyral sheet clear or tinted, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

2.3 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - 1. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
 - 2. Protect glass edges from damage during handling and installation. Remove glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance from Project site and legally dispose of off Project site.
 - 3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by sealant compatibility and adhesion testing.
 - 4. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - 5. Provide spacers for glass lites where the length plus width is larger than 50 inches unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances.
- B. Protection:
 - 1. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface.
 - 2. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter.
- C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged, including natural causes, accidents, and vandalism, during construction period.

END OF SECTION